KIT
Karlsruher Institut für Technologie

Institut für Hydromechanik (IfH)
Prof. Dr.-Ing. Markus Uhlmann

Institut für Mechanik (IFM)
Prof. Dr.-Ing. Peter Betsch
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Institut für Strömungsmechanik (ISTM)
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Prof. Dr.-Ing. Thomas Böhlke
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Prof. Dr.-Ing. Carsten Proppe
Prof. Dr.-Ing. Wolfgang Seemann

Kolloquium für Mechanik

Referent:	**Dr. Anthony Wachs** Fluid Mechanics Department, IFP Energies nouvelles, Solaize, FRANCE
Datum:	Do., 09.07.2015
Uhrzeit:	15:45 Uhr
Ort:	Geb. 10.81, HS 62 (R 153)
Titel:	**Particulate flow across multi-scales: numerical strategies for momentum, heat and mass transfer**

Abstract

Particulate flows are ubiquitous in environmental, geophysical and engineering processes. The intricate dynamics of these two-phase flows is governed by the momentum transfer between the continuous fluid phase and the dispersed particulate phase. When significant temperature differences exist between the fluid and particles and/or chemical reactions take place at the fluid/particle interfaces, the phases also exchange heat and/or mass, respectively. While some multi-phase processes may be successfully modelled at the continuum scale through closure approximations, an increasing number of applications require resolution across scales, e.g. dense suspensions, fluidized beds. Within a multi-scale micro/meso/macro-framework, we develop robust numerical models at the micro and meso-scales, based on a Distributed Lagrange Multiplier/Fictitious Domain method and a two-way Euler/Lagrange method, respectively. Particles, assumed to be of finite size, potentially collide with each other and these collisions are modeled with a Discrete Element Method. We discuss the mathematical issues related to modeling this type of flows and present the main numerical and computational features of our simulation methods. We also illustrate what can be gained from massively parallel computations performed with our numerical code PeliGRIFF, in terms of physical insight into both fundamental questions and applications from the chemical engineering and process industry. Finally, we explain how knowledge gained at the micro scale can cascade upwards and contribute to the development of enhanced meso and macro-scale models.

Alle Interessenten sind herzlich eingeladen.

Prof. Dr.-Ing. Markus Uhlmann

PeliGRIFF
Parallel Efficient LIbrary for GRains In Fluid Flows